United States General Accounting Office

GAO

Report to the Chairman, Committee on Armed Services, House of Representatives

October 1993

MINIMIZING FRIENDLY FIRE

The Army Should Consider Long-Term Solution in Its Procurement Decision on Near-Term Needs

GAO/NSIAD-94-19

GAO

United States
General Accounting Office
Washington, D.C. 20548

National Security and
International Affairs Division

B-253863

October 22, 1993

The Honorable Ronald V. Dellums
Chairman, Committee on Armed Services
House of Representatives

Dear Mr. Chairman:

As requested, we reviewed the Army's ongoing efforts to develop a combat identification program to minimize ground-to-ground and air-to-ground friendly fire or "fratricide" incidents. Specifically, we reviewed the currently planned phases of the Army's Battlefield Combat Identification System (BCIS) program.

Results in Brief

The Army plans to spend up to $100 million on a near-term combat identification system that might be eventually discarded if it cannot be integrated into a long-term solution. The Army currently plans to begin producing a near-term system about 15 months before it decides what the cost-effective, long-term solution might be.

The Army plans to buy 1,520 near-term systems to equip some "first to fight" forces, including ground vehicles and helicopters. However, this would not be enough for a larger-scale operation, leaving forces still subject to fratricide. Moreover, since the near-term system will not be used on fixed-wing aircraft, this system will not provide adequate coverage in any conflict involving them in close air support.

Other combat identification and situational awareness systems developed in recent years have upgraded the military's capability in this area and could serve as interim improvements until the Department of Defense (DOD) and the Army are certain that the near-term system can be integrated into the long-term solution. These systems could provide ground vehicle crews with an initial target identification[1] and enhanced situational awareness[2] capability to help reduce the risk of fratricide.

[1]Target identification is the process of determining the friendly or hostile character of a detected contact.

[2]Situational awareness is having knowledge of the relative positions of friends, foes, neutrals and noncombatants in an operational environment.

Background

The Army noted that the friendly fire casualties and equipment losses suffered during Operation Desert Storm underscored the need for a more effective means of identifying friendly and hostile forces, and neutrals and noncombatants on the modern battlefield. To enhance force warfighting capability and minimize fratricide in the future, the Army is pursuing a combat identification program to improve situational awareness and provide immediate, positive target identification.

The Army determined that the term "combat identification" would encompass all antifratricide measures and would address situational awareness and immediate, positive combat target identification capabilities. Its overall strategy for developing and fielding combat identification systems is to equip a limited number of ground troops as soon as possible and to improve on this capability incrementally. In 1991, the Army started implementing a five-phased program to develop and field BCIS through fiscal year 2000.

The five phases of the Army's BCIS program are (1) quick-fix, (2) quick-fix plus, (3) near-term, (4) mid-term, and (5) long-term. The quick-fix phase includes the development and production of various infrared systems. The quick-fix plus phase includes the development and production of positive navigation systems and the integration of global positioning systems to enhance situational awareness as well as further developments in thermal identification systems. The near-term phase objective is to integrate battlefield combat identification systems into selected ground vehicles and helicopters. A millimeter wave question and answer system has been selected as the near-term technology. The mid- and long-term phase objectives are to integrate situational awareness and target identification and to have an automated correlation and display of situational awareness and target identification information. The mid- and long-term BCIS could be different than the near-term millimeter wave system.

The Army Should Ensure That Near-Term System Can Be Integrated Into Long-Term Solution

The Army intends to begin production of the near-term BCIS in July 1995, or about 15 months before it decides what the mid- and long-term solution(s) will be. The Army's plan includes force demonstrations of target identification and situational awareness systems between April and July 1996. According to an Army official, based on the results of these demonstrations, the Army will decide by October 1996 which of the mid- and long-term solutions to pursue.

The Army's ability to evolve the near-term BCIS to the mid-and long-term solution(s) is dependent on the decision of what technology will be pursued in the mid- and long-term. Moving forward with the production of the near-term BCIS before this decision is made could result in spending millions of dollars on a system that cannot be integrated into the long-term solution.

DOD provided guidance to the Army on development of a near-term BCIS to ensure that near-term applications and technology demonstrations do not prejudice or obstruct the achievement of an integrated, cost-effective, long-term solution. To that end, DOD initially limited Army expenditures for development, production, and integration of a near-term system to at most $100 million.

While this report was at DOD for comment, the Deputy Assistant Secretary of Defense, Command, Control, Communications and Intelligence, instituted additional oversight of BCIS. A July 30, 1993, memorandum from the Deputy Assistant Secretary stated that DOD continues "to have strong concerns regarding the potential cost of the millimeter-wave approach, which essentially makes it a competitor for the long-term solution." The memo also said that a decision on whether to proceed with production of the near-term BCIS should be made in the context of (1) the long-term alternatives, (2) refinement of the overall program costs, (3) a better understanding of the design for aircraft applications, and (4) clarification of Joint and Allied interoperability implications. The memo also placed a lower limit of about $50 million in initial funding for the near-term BCIS program. We believe this new guidance provides much needed oversight of the program.

BCIS Fielding Plan Would Limit the Use of the Near-Term Combat Identification System

The Army plans to procure a total of 1,520 near-term BCIS for selected ground vehicles and helicopters. The Army selected a millimeter wave question and answer system as the near-term technology. To be effective, the use of a question and answer system requires that both shooter and non-shooter be equipped. If a shooter equipped with this system queries a target, the target must also be equipped in order to respond. If the shooter does not receive a response, the target is categorized as unknown and the shooter should proceed under the normal rules of engagement. Thus, unequipped friendly targets are at least as subject to friendly fire as before. In addition, a shooter that is not equipped with the system is as likely to attack an equipped friendly target.

This fielding plan means that the coverage provided would not be sufficient in conflicts requiring the support of larger forces or for missions requiring close air support using fixed-winged aircraft. A limited number of systems would be ineffective in a conflict requiring the support of thousands of vehicles. For example, vehicle deployments in Operation Desert Storm included over 2,300 M1A1 Abrams tanks, 2,200 Bradley Fighting Vehicles, 20,000 High Mobility Multipurpose Wheeled Vehicles (HMMWV), over 4,400 Heavy Expanded Mobility Tactical Trucks, over 29,000 Tactical Wheeled Vehicles, and several thousand other wheeled vehicles.

According to Army officials, the planned procurement of 1,520 near-term millimeter wave question and answer systems will be used to equip both shooters and non-shooters in some "first to fight" forces. The vehicles expected to receive this equipment include the M1A1 Abrams tank, M2A2 and M3A2 Bradley Fighting Vehicles, attack helicopters, and HMMWVs. As specifically planned and defined in the BCIS Operational Requirements Document, the Army's near-term solution is not being developed for use by fixed-wing aircraft. Combat identification is important for fixed-wing aircraft, given that 9 of the 35 (26 percent) soldiers killed by friendly fire in Desert Storm were killed by fixed-wing aircraft.

Other Systems Being Fielded to Provide Target Identification and Situational Awareness

In addition to developing near-, mid-, and long-term BCIS systems, the Army currently has systems available and is pursuing other programs to provide the crews of selected ground vehicles with initial target identification and enhanced situational awareness capabilities. As part of the combat identification system program, the Army has already fielded infrared identification systems under the quick-fix program. Currently, the Army is in the process of fielding position/navigation equipment and a Thermal Identification System, under the quick-fix plus program, designed to provide a greater capability than that provided by the quick-fix solutions.

The quick-fix plus solutions include integration of the Small Lightweight Global Positioning System Receivers (SLGR) and Precision Lightweight Global Positioning System Receivers (PLGR) into M1A1 Abrams tanks, M2A2 and M3A2 Bradley Fighting Vehicles, and HMMWVs. These receivers will enable weapon crews to determine their own position by providing them with satellite derived position data. The quick-fix plus solutions also include the integration of a compass into M1A1 Abrams tanks, and M2A2 and M3A2 Bradley Fighting Vehicles. The integration of the Global Positioning System receivers and the compasses is expected to enhance situational awareness, which should reduce fratricide.

In addition to quick-fix plus solutions, the Army is planning to install a gyrocompass that serves as both a compass and position locator aboard the M1A2 Abrams tank and M2A3 and M3A3 Bradley Fighting Vehicles. Army officials stated that this system, when tied into the intervehicular information system installed on M1A2 Abrams tanks and M2A3 and M3A3 Bradley Fighting Vehicles, will also provide an enhanced situational awareness capability.

DOD commented that the current identification devices do not match current target acquisition ranges and are easily exploitable. DOD believes it is their low cost that makes them effective as a stopgap. DOD commented that the current navigation aids provide a vehicle with its own location and direction, but not the locations of other friendly vehicles.

Current identification devices could be exploited. However, it is also possible that unfriendly forces could develop millimeter wave detection devices, and could thus be able to exploit this system. Furthermore, Army officials told us that the integration of navigation devices with secure communications devices is being developed. This enhancement will not only show the commander his position, but also the positions of other friendly forces. Additionally, this integration will enhance the commander's ability to wage the battle.

The devices fielded and being fielded under the first two phases of the Army's BCIS program, quick-fix and quick-fix plus, provide target identification and situational awareness enhancements that should help to reduce fratricide. The $100 million near-term millimeter wave system would not expand significantly upon this protection. Only the 1,520 vehicles to be equipped would receive added protection against fratricide. However, they would only receive added protection from each other. All vehicles would still remain vulnerable to fratricide from fixed-wing aircraft.

Recommendation

To help ensure that the Army does not produce a costly system that (1) would provide insufficient coverage in large conflicts or any conflict involving fixed-wing aircraft and (2) may not be able to be integrated into a long-term solution, and would thus be discarded a few years after fielding, we recommend that the Secretary of Defense direct the Secretary of the Army not to proceed with the production of a near-term BCIS until the Army determines whether the near-term technology can be integrated into the mid- and long-term target identification solution(s).

Agency Comments and Our Evaluation

In commenting on a draft of this report, DOD agreed that the integration of the near-term system into the long-term approach is an important consideration in deciding on the production of the near-term system. However, DOD indicated that it might be prudent to implement the near-term system regardless of the long-term solution(s) to be identified later. DOD stated that factors favoring the implementation of the near-term system include the limited performance of quick-fix and quick-fix plus devices, and the length of time that may be required, 10 years or more, before a long-term system can be fielded.

We believe that the Army needs to make an informed decision on the production of the near-term system. This decision needs to be based on whether the near-term system will be able to be integrated into the mid- and long-term solution(s), which should be possible when the mid- and long-term solution(s) to be pursued are determined—about 15 months after the current scheduled near-term production decision. Our recommendation would not prevent the Army's acquisition of the near-term system and would not require the Army to wait until long-term systems are fielded. Rather, we believe that it would be prudent for the Army to make its production decision for the near-term system, taking into consideration its decision for the mid- and long-term solution(s).

The July 30, 1993, memorandum on the BCIS stated that a decision on whether to proceed with production of the near-term BCIS would be made in the context of (1) the long-term alternatives, (2) refinement of the overall program costs, (3) a better understanding of the design for aircraft applications, and (4) clarification of Joint and Allied interoperability implications. The memo also placed a lower limit of about $50 million in initial funding for the near-term BCIS program. We are encouraged by this new guidance, which provides better oversight of the program and is in concert with our recommendation.

However, we remain concerned that the Army may proceed with the production of a near-term system without making a fully informed decision. For this reason, we will continue to monitor the Army's actions to initiate production of the near-term system. DOD's comments are addressed in the body of this report where appropriate, and are reprinted in their entirety in appendix I, along with our evaluation.

Scope and Methodology

During this review, we interviewed officials and reviewed documents in Washington, D.C., at the offices of the Assistant Secretary of Defense for

Command, Control, Communications and Intelligence; the DOD Joint Combat Identification Office; the Assistant Secretary of the Army for Research, Development, and Acquisition; the U.S. Army, Assistant Deputy Chief of Staff for Operations and Plans. We also reviewed documentation issued from the offices of the Under Secretary of Defense for Acquisition and the Joint Requirements Oversight Council. We obtained information from the U.S. Army Communications and Electronic Command, Ft. Monmouth, New Jersey; the U.S. Army Research Laboratory, Combat Identification Systems Program Office, Ft. Meade, Maryland; the U.S. Army Training and Doctrine Command, Ft. Monroe, Virginia; and the U.S. Army Armor Center and School, Ft. Knox, Kentucky.

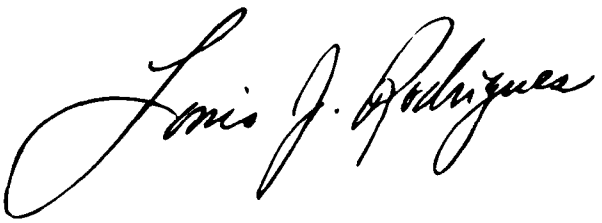
In addition, we visited and received briefings from Army personnel on the Combat Identification Technology Demonstration conducted at Ft. Bliss, Texas. We also visited and received briefings on the armor training exercises conducted at the U.S. Army National Training Center, Ft. Irwin, California.

We conducted this review from September 1992 to May 1993 in accordance with generally accepted government auditing standards.

Unless you publicly announce its contents earlier, we plan no further distribution of this report until 30 days after its issue date. At that time, we will send copies to the Secretary of Defense and other appropriate congressional committees. We will also make copies available to others on request.

Please contact me at (202) 512-4841 if you or your staff have any questions concerning this report. Major contributors to this report were William L. Wright, Assistant Director; John M. Murphy, Jr., Issue Area Manager; Michael F. McGuire, Evaluator-in-Charge; and Bruce H. Thomas, Evaluator.

Sincerely yours,



Louis J. Rodrigues
Director, Systems Development
and Production Issues

Comments From the Department of Defense

Note: GAO comments supplementing those in the report text appear at the end of this appendix.

COMMAND CONTROL COMMUNICATIONS AND INTELLIGENCE

ASSISTANT SECRETARY OF DEFENSE

WASHINGTON, D.C. 20301-3040

August 30, 1993

Mr. Frank C. Conahan
Assistant Comptroller General
National Security and International
Affairs Division
U.S. General Accounting Office
Washington, D.C. 20548

Dear Mr. Conahan:

This is the Department of Defense (DoD) response to the General Accounting Office (GAO) draft report, "COMBAT IDENTIFICATION: Army Should Ensure System Can Be Integrated Into Long-Term Solution," dated July 28, 1993 (GAO Code 395206/OSD Case 9480). The Department partially concurs with the report.

See comment 1.

See comment 2.

The GAO draft report recommends that the DoD not proceed with the production of a near-term Battlefield Combat Identification System until it has been determined that the near-term technology can be integrated into (i.e., usefully employed with) the long-term solution. The Department agrees that is a significant consideration in a decision on production of the near-term system, and believes that the near-term capability is very likely to be a useful component of the long-term approach. It may be prudent, however, to produce the near-term system even if it is not part of the long-term architecture. The Department is concerned that, without a near-term system, U.S. forces may face a period of ten years or more with no substantial improvement in their capability to identify combat vehicles. This should not be overlooked in deciding on production of the near-term Battlefield Combat Identification System.

The detailed DoD comments on the report findings and recommendation are provided in the enclosure. The DoD appreciates the opportunity to comment on the draft report.

Sincerely,

Emmett Paige, Jr.

Enclosure

**GENERAL ACCOUNTING OFFICE DRAFT REPORT - DATED JULY 28, 1993
(GAO CODE 395206) OSD CASE 9480**

"COMBAT IDENTIFICATION: ARMY SHOULD ENSURE SYSTEM CAN BE INTEGRATED INTO LONG-TERM SOLUTION"

DEPARTMENT OF DEFENSE COMMENTS

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FINDINGS

- **FINDING A: More Effective Means of Identifying Friendly and Hostile Forces, and Neutrals and Noncombatants on the Modern Battlefield Is Needed.** The GAO reported that, to enhance force warfighting capability and minimize fratricide in any future conflict, the Army is pursuing a combat identification program to improve situational awareness and provide immediate, positive target identification. The GAO noted that the Army had determined that the term "combat identification" would encompass all anti-fraticide measures and would address situational awareness and immediate, positive combat target identification capabilities.

  The GAO explained that the overall Army strategy for developing and fielding combat identification systems is (1) to equip a limited number of ground troops as soon as possible and (2) to improve on that capability incrementally. The GAO reported that, in 1991, the Army started implementing a four-phased program to develop and field Battlefield Combat Identification Systems through FY 2000. The GAO noted that the four phases of the Army Battlefield Combat Identification are (1) quick-fix, (2) quick-fix plus, (3) near-term, and (4) mid-term and long term phases. (pp. 2-4/GAO Draft Report)

  DoD RESPONSE: Concur.

- **FINDING B: The Army Should Ensure That Near-Term System Can Be Integrated Into Long-Term Solution.** The GAO reported that the Army intends to begin production of the near-term Battlefield Combat Identification System in July 1995--or about 15 months before it decides what the mid-term and long-term solution(s) will be. The GAO noted that the Army plan includes force demonstration of target identification and situational awareness systems between March and June 1996. The GAO also noted that according to an Army Official, based on the results of the demonstrations--the Army will decide by September 1996 as to which of the mid-term and long-term solutions to pursue.

Enclosure

Now on p. 2.

The GAO concluded that the ability of the Army to evolve the near-term Battlefield Combat Identification System to the mid-term and long-term solution(s) is dependent on the decision of what technology will be pursued in the mid-term and long-term. The GAO further concluded moving forward with the production of the near-term battlefield combat identification system before that decision is made could result in spending millions of dollars on a system that cannot be integrated into the long-term solution.

The GAO noted that the DoD provided guidance to the Army on development of a near-term Battlefield Combat Identification System to ensure that near-term applications and technology demonstrations do not prejudice or obstruct the achievement of an integrated, cost-effective, long-term solution. The GAO found, to that end, the DoD limited Army expenditure for development, production, and integration of a near-term system to at most $100 million. In summary, the GAO concluded that the Army should ensure that the near-term system can be integrated into the long-term solution. (pp. 4-5/GAO Draft Report)

Now on pp. 2-3.

DoD RESPONSE: Partially concur. The DoD agrees that the integration of the near-term Battlefield Combat Identification System into the long-term approach is an important consideration in deciding on the production of the near-term system. The Department anticipates that the millimeter-wave sensor will contribute information to a long-term architecture that emphasizes situation awareness. It might be prudent, however, to implement the near-term technology even if it is not useful in the long-term approach. The primary factors favoring implementation of the near-term system are the limited performance of the quick-fix and quick-fix-plus devices, and the length of time that may be required before the long-term system can be fielded. Without a near-term system, U.S. forces may face a period of 10 years or more with no substantial improvement in their capability to identify combat vehicles.

See comment 3.

- **FINDING C: Battlefield Combat Identification System Fielding Plan Would Limit the use of the Near-Term Combat Identification System.** The GAO found that the Army plans to procure a total of 1,520 near-term Battlefield Combat Identification Systems for selected ground vehicles and helicopters. The GAO further found that the Army selected a millimeter wave question and answer system as the near-term technology. The GAO learned that, to be effective, the use of a question and answer system required both shooter and non-shooter to be equipped. The GAO, therefore, concluded that under the Army near-term fielding plan (1) unequipped friendly targets will be at least as

subject to friendly fire as before and (2) a shooter that is not equipped with the system is as likely to attack an equipped friendly target. The GAO further concluded the Army fielding plan means that the coverage provided would not be sufficient in conflicts requiring the support of larger forces or for missions requiring close air support using fixed-winged aircraft.

The GAO reported that, according to Army officials, the Army is planning to equip both shooter and non-shooters in some "first to fight" forces with near-term millimeter wave systems. The GAO noted that the vehicles expected to receive the equipment include the M1A1 Abrams tank, the M2A2 and the M3A2 BRADLEY Fighting Vehicles, the attack helicopters, and the High Mobility Multipurpose Wheeled Vehicles. The GAO also found that, as specifically planned and defined in the Battlefield Combat Identification System Operational Requirements Document, the near-term Army solution is not being developed for use by fixed-wing aircraft. The GAO asserted, however, that combat identification is important for fixed-wing aircraft, given that 9 of the 35 soldiers killed by friendly fire in DESERT STORM (26 percent) were killed by fixed-wing aircraft. In summary, the GAO concluded that a limited number of systems would be ineffective in a conflict requiring the support of thousands of vehicles--as was the case in OPERATION DESERT STORM. (pp. 5-7/GAO Draft Report)

Now on pp. 3-4.

DoD RESPONSE: Partially concur. The effectiveness of any cooperative identification system is partly dependent on the extent of its deployment, but some effectiveness exists even if all units are not equipped. A final decision on the extent of implementation of the near-term Battlefield Combat Identification System has not been made and will depend on a number of factors, including cost and operational utility. Regarding aircraft applications, it should be noted that ground-to-ground incidents comprised the great majority of fratricidal engagements in OPERATION DESERT STORM. Because of the potential for short decision times and intermingling of forces on the ground, it is those types of situations that most demand a rapid, automated identification device. It may be more cost-effective to address air-to-ground engagements by improving situation awareness. Nevertheless, the DoD plans to study the application of the near-term system to both helicopters and fixed wing aircraft.

See comment 4.

See comment 5.

- FINDING D: The Other Systems Being Fielded to Provide Target Identification and Situational Awareness. The GAO reported that, in addition to developing near-term, mid-term, and long-term Battlefield Combat Identificaiton System systems, the Army currently has systems available

and is pursuing other programs to provide the crews of selected ground vehicles with initial target indentification and enhanced situational awareness capabilities. The GAO noted that, as part of the combat indentification system program, the Army has already fielded infrared identification systems under the quick-fix plus program, which is designed to provide a greater capability than that provided by the quick-fix solutions.

The GAO concluded that the devices fielded and being fielded under the first two phases of the Army Battlefield Combat Identification System program, quick-fix and quick-fix plus, provide target identification and situational awareness enhancements that should help to reduce fratricide. The GAO also concluded that the $100 million near-term millimeter wave system would not expand upon the protection, except in situations when only the 1,520 vehicles to be equipped would be used without augmentation by other vehicles and without the use of fixed-wing air support. (pp. 7-9/GAO Draft Report)

Now on pp. 4-5.

DoD RESPONSE: Partially concur. The DoD agrees with the GAO report description of the capability of the quick-fix devices. The limitations of these devices, however, should also be described. The quick-fix navigation aids provide a vehicle with its own location and direction, but not the locations of other friendly vehicles. The quick-fix identification devices do not match the target acquisition ranges and are easily exploitable; it is their low cost that makes them effective as a stop-gap. Additionally, the GAO statement that partial implementation of the near-term system "would not expand upon the protection" (provided by the quick-fix devices) can be interpreted to mean that, in a conflict involving more than 1,520 vehicles, the near-term system would be totally ineffective. But even if all platforms are not equipped, every additional identification by the near-term Battlefield Combat Identification System will help to reduce fratricide.

See comment 6.

See comment 7.

* * * * *

RECOMMENDATION

- **RECOMMENDATION:** The GAO recommended that, to help ensure the Army does not produce a costly system--which (1) would provide insufficient coverage in large conflicts or any conflict involving fixed-wing aircraft, and (2) may not be able to be integrated into a long-term solution, and would thus be discarded a few years after fielding--the Secretary of Defense direct the Secretary of the Army not to proceed with the production of a near-term Battlefield Combat Identification System until the Army determines whether the

Now on pp. 5-6.

near-term technology can be integrated into the mid-and long-term target identification solution(s). (p. 9/GAO Draft Report)

See comments 2 and 8.

DoD RESPONSE: Partially concur. The Department agrees that technology integration is a significant factor in a decision on the production of the near-term system, and fully expects the near-term system to continue to be useful in the long-term architecture. Other factors are also important in a production decision, however, as discussed in the DoD response to Finding B. In this regard, the Chairman of the Command, Control, Communications and Intelligence Systems Committee notified the Army on July 30, 1993, that while the "strategy of implementing a near-term system is supported...we continue to have strong concerns regarding the potential cost of the millimeter-wave approach." As a result, the Chairman placed limits on the development effort, and indicated that a production decision "will be made in the context of the long-term alternatives, refinement of the overall program costs for the millimeter-wave approach, a better understanding of the design for the aircraft applications, and clarification of the Joint and Allied interoperability implications." The direction limits the initial funding commitment to the near-term system to approximately $50 million. The production decision is currently planned to occur in approximately two years. In any case, the near-term system, if implemented, would not "be discarded after a few years of fielding" as indicated by the GAO. Even if the near-term technology is not useful in the long-term system, the time to develop the long-term approach could result in reliance on the near-term equipment for a period of ten years or more.

GAO Comments

1. DOD initially interpreted our use of the term "integrate" to require "technical commonality" between the near-term system and the mid- and long-term solution(s). Our intended meaning, when discussing integration of a near-term system into the mid- and long-term solution(s), is that the near-term system be able to be usefully employed with the mid- and long-term solution(s).

2. We believe that the Army needs to make an informed decision on the production of the near-term system. Among other things, this decision needs to be based on whether the near-term system will be able to be integrated into the mid- and long-term solution(s), which should be possible when the mid- and long-term solution(s) to be pursued are determined about 15 months after the current scheduled near-term production decision. Our recommendation would not prevent the Army's acquisition of the near-term system and would not require the Army to wait until long-term systems are fielded. Rather, we believe that it would be prudent for the Army to make its production decision for the near-term system taking into consideration its decision for the mid-and long-term solution(s).

We do not believe that it can be fairly stated that the near-term system will very likely be a useful component of the long-term approach before the long-term approach has even been determined.

3. We agree that the performance of the quick-fix and quick-fix plus devices is an important factor in the decision to produce the near-term BCIS. However, also important to that decision is, as DOD has stated, that these devices' low cost makes them effective as a stop-gap measure. Another important factor is the fact that situation awareness devices (quick-fix plus) are being upgraded to have even more capability.

The time to field the long-term solution(s) is also an important decision factor. But the fielding time, which could be as much as 10 years, according to DOD, is not the time we are concerned with. Rather, our concern is that DOD and the Army not proceed with the production of the near-term BCIS until they know whether it can be integrated with the mid- and long-term solution(s). The Army estimates that it should be able to determine whether the near-term BCIS can be integrated with the mid- and long-term solution(s) about 15 months after the current scheduled production decision for the near-term BCIS.

By taking into consideration the to be determined mid- and long-term solution(s) in the production decision on the near-term BCIS, DOD and the Army would be in a better position to determine if the near-term BCIS can work with the mid- and long-term technology proposals, and the alternatives, if it cannot. We noted that DOD's July 30, 1993, revised guidance on the program states, in part, that a decision on whether to proceed further with the near-term BCIS will be made in the context of, among other things, the long-term alternatives.

4. We agree with DOD that fielding 1,520 near-term systems would provide additional fratricide protection, and we have changed the wording in our report to reflect this. However, only the 1,520 vehicles provided these devices would receive added protection from fratricide, and at that, the protection would only be from the shooters among the 1,520 equipped. In large conflicts, like Operation Desert Storm, where fratricide is most likely to occur, fielding 1,520 devices would provide insignificant and inadequate coverage. In order to make a prudent decision on the production of a near-term system, the Army needs to consider whether the near-term system is going to be fielded in sufficient quantities to provide significant coverage. In a period of limited funding availability, it is unlikely that a decision on how many total near-term systems to procure could be properly made before the mid- and long-term solution(s), their potential and costs, and their likely time of fielding have been estimated.

5. We acknowledge that the majority of the fratricide that occurred in Operation Desert Storm was ground-to-ground. As DOD notes, and we agree, it may be more cost-effective to address air-to-ground with situational awareness. However, the same can be said for ground-to-ground fratricide. According to an Office of Technology Assessment report, Army data collected during training exercises at the National Training Center indicates that about 83 percent of ground-to-ground fratricide incidents from a number of simulated battles resulted from a lack of situational awareness.[1] A determination of whether situational awareness is a more cost-effective solution should be made in the process of deciding what mid- and long-term solution(s) to pursue.

6. We have added information on the weaknesses of the quick-fix and quick-fix plus to our report.

[1]U.S. Congress, Office of Technology Assessment, Who Goes There: Friend or Foe?, OTA-ISC-537 (Washington, D.C.: U.S. Government Printing Office, June 1993).

7. We have changed our report to reflect the limited fratricide protection that would be provided by fielding 1,520 near-term systems.

8. The July 30 memorandum's guidance on the BCIS is in concert with our recommendation and is an important step forward in providing appropriate oversight for this program. However, we remain concerned that the Army may proceed with the production of a near-term system without making a fully informed decision. For this reason, we will continue to monitor the Army's actions to initiate production of the near-term system.